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FEDERAL AVIATION ADMINISTRATION
UNITED STATES DEPARTMENT OF TRANSPORTATION

MODIFICATION OF THE DIMENSIONS OF THE GRAND CANYON NATIONAL PARK SPECIAL FLIGHT RULES AREA AND FLIGHT FREE ZONES	Docket No. 99-5926 - 37 Notice No. 99-l 1
COMMERCIAL AIR TOUR LIMITATION IN THE GRAND CANYON NATIONAL PARK SPECIAL FLIGHT RULES AREA	Docket No. 99-5927-J 6 Notice No. 99-12

COMMENTS OF GRAND CANYON AIRLINES

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Submitted on September 3, 1999

I. Introduction

The present notice of proposed rulemaking is the latest in a long line of rulemakings pursuant to Public Law 100-91 that have as their stated aim the restoration of the "natural quiet and experience" at the Grand Canyon National Park ("GCNP"). The first of these rulemakings, SFAR 50-2, established minimum flight altitudes, banned flights below the rim of the GCNP, and created flight-free zones over large areas of the GCNP.

Subsequent to the institution of SFAR 50-2, the number of complaints about aircraft noise from visitors to the GCNP declined to a statistically insignificant level as has been borne out by visitor surveys. A reasonable interpretation of Public Law 100-91 would lead one to conclude that natural quiet has been restored. The current GCNP Superintendent has even admitted that there are very few complaints each year from GCNP visitors about air tour aircraft.

The latest NPRM states that "Public Law 100-91 recognizes that noise associated with 'aircraft overflights' at the GCNP is causing 'a significant adverse effect on the natural quiet and experience of the park."' Federal Register, Vol. 64 p. 37307. Of course, Public Law 100-91 spoke to conditions in the mid-1980's and it is disingenuous to quote the law as if it spoke to present conditions. Since that date, prior rulemakings have restricted air tours over vast areas of the GCNP. This has effectively shielded well over 90% of GCNP visitors from all noise generated by air tours (though some are still subject to noise generated by NPS' aircraft) and severely limiting the exposure of all other GCNP visitors from sounds generated by air tours.

Notwithstanding this fact, the National Park Service and the FAA determined that natural quiet had not been restored to the GCNP. They reached this conclusion by adopting a definition of natural quiet that was not contemplated or suggested by the language and intent of Public Law 100-91. The sterile definition now adopted by the FAA makes no reference to the experience of

the visitor. This definition, along with the various rules proposed or enacted to attain this notion of "natural quiet" have led to ridiculous results. With the proposed rule, the FAA proposes measures to reduce aircraft noise that have societal costs that far outweigh any benefit to society. The FAA admits this fact even after it generously measures supposed benefits and ignores most of the costs to society of the new rule. The insanity of the course that the FAA and NPS have embarked on is clearly underscored by the present proposed rule.

II. The Proposed Rules Are Invalid Because They Address a Problem Defined by Faulty Noise Evaluation Methodology

The NPS has previously determined that "substantial restoration of natural quiet" to GCNP requires that at least 50 percent of the GCNP achieve "natural quiet" 75- 100% of the day. Previously, the NPS defined "natural quiet" as ambient sound plus 3dB. This level was chosen because it represented a threshold of "noticeability" for exogenous sounds. However, on January 26, 1999, the NPS issued a public notice in which it intended to revise this definition for large areas of the GCNP to ambient sound levels minus 8dB.

The NPS did not disclose how it arrived at these new thresholds in making the public notice other than to state that "differences in geography, development circumstances, or regulatory restraints of particular areas of the park, [might make it]appropriate to apply different noise threshold to different parts of GCNP. . . ." This latest action by the NPS is curious in that we have been told for years that "natural quiet" is something akin to a cosmological constant-a scientifically defined state that is divorced from considerations such as visitor experience or levels of annoyance. Now, suddenly, "differences in geography" (which are not discussed or explained) and "development circumstances" justify different definitions of natural quiet. Ironically, the NPS now proposes that a higher sound threshold be used in those areas of the

GCNP frequented by the most visitors and a stricter standard in areas visited by comparatively few visitors. The NPS does not disclose how it arrived at the new threshold and cites no scientific support for its new threshold. Because it did not disclose its methodology, commenters could not comment on the methodology.

The NPS promised to discuss and seek public comment on its "model validation study" and "noise monitoring strategy." This is an admission that much work is to be done on its noise models and monitoring before it can even be equipped to rationally make rules aimed at addressing problems of noise propagation. The NPS is clearly putting the cart before the horse. The NPS clearly recognizes the limitations of using an unproven methodology stating that "[t]he NPS and the FAA will use this refined methodology in future evaluations of the substantial restoration of natural quiet at GCNP, unless science or public planning processes provide better approaches." This is an incredible stretch of proper administrative procedure. Why wouldn't science be consulted before this methodology is adopted? Why doesn't the NPS provide all relevant material relating to this notice to the public for review and comment?

The notice by the NPS is also violates the Administrative Procedures Act and the due process rights of air tour operators. What is the point of issuing public notices unless rules or policies remain onlv proposed until the federal agencies take into account the views of the concerned public?

Finally, the NPS is continuing to blur its statutory mandates in order to justify greater and greater restrictions on air tours over the GCNP. Public Law 100-91 did not contemplate differing standards for different parts of the GCNP. Furthermore, the NPS's public notice ignores its mandate to "provide for [the] enjoyment [of the GCNP]." This methodology will make it impossible for hundreds of thousands of people to enjoy backcountry vistas in the GCNP

while doing little, if anything, to improve the experience of a handful of other visitors. Clearly the NPS is ignoring its most important statutory mandate.

III. The FAA has failed to distinguish between noise created by air tours and other flights

Unfortunately, the FAA refuses to turn its back on a rule that is not justified on a cost/benefit basis. Furthermore, the FAA states that it "would need to take further steps to achieve the substantial restoration of natural quiet." The only steps it contemplates to achieve its goal of "natural quiet" divorced from visitor experience is that "commercial-air tours would be further limited." The FAA believes (or professes to believe) that (a) a substantial problem with aircraft noise exists at GCNP, (b) only air tour flights cause this problem, and (c) only restrictions on air tour flights can address the problem. These premises are flawed.

A. FAA admits noise from other flights exists but has not bothered to measure it.

Clearly flights other than air tours can have an impact on visitors. However, the FAA mindlessly attributes all the bad effects of such flights to air tours. The FAA states that "this noise has not been measured or included in the noise models used to obtain the estimates contained in this analysis because the FAA believes the amount of noise produced by these aircraft is very small compared to that of commercial air tour aircraft." This unsupported conclusion is typical of the sloppy scientific method applied by the FAA.

B. FAA has ignored the impact on visitors of Park Service flights and other commercial flights that occur within flight-free zones.

The FAA's analysis of aircraft noise is flawed for several reasons. First, the studies of aircraft noise do not distinguish between noise created by NPS flights and commercial flights other than air tours. The NPS routinely conducts many flights within the SFAR. These flights include flights within flight-free zones that are off-limits to air tours. Furthermore, NPS' fligths routinely operate below the rim of the canyon, hovering at low altitudes on such missions as search and rescue and trash removal.' By their very nature, these flights are much more likely to annoy or have an impact on GCNP visitors. Similarly, large commercial aircraft routinely fly the entire length of the SFAR on a major east coast/ west coast airway and do so twenty-four hours a day. These large commercial planes generate much more noise than air tour planes. These large commercial jet air carrier planes on approach to McCarran airport fly over the Sanup flight free zone at an altitude of approximately 22,000 feet and are conducted on a major jet airway twenty-four hours a day.

Importantly, the proposed rule does not address limiting any flights other than air tours. This leads to a perverse situation whereby the Park Service could conduct annoying flights in flight free zones (where visitors are more likely to be encountered) and then use this annoyance to justify further limitations on air tours that did not cause the annoyance. The great majority of air tours are conducted over remote areas of the GCNP that are not frequented by many visitors. Moreover, the visitors in these areas are likely to be visitors on river tours who can rarely, if ever hear aircraft above the ambient noise of the river. Ironically, many of these visitors are in fact guilty of generating noise (from riverboat motors) that is much more obnoxious and loud than that generated by air tours. It is the height of hypõcrisy to allow the generators of such noise to

[1] Air tour flights below the rim of the canyon are specifically banned by Public Law 100-91.

complain about noise from aircraft that is far smaller in magnitude than that generated by riverboat motors. One might liken such motorized rafters' complaints as being akin to a chain smoker complaining about secondary smoke from others when he is not lit up!

C. The GCNP Visitor surveys used to estimate benefits of the NPRM fail to distinguish between air tours and other flights in the SFRA.

The visitor response surveys relied upon by NPS and the FAA to measure the impact of aircraft noise do not in any way distinguish between aircraft noise from air tours and these other categories of flights in the SFAR. As pointed out above, this results in the NPS and FAA attributing the ill effects of flights other than air tours to air tour operators. This is fundamentally unfair, arbitrary and capricious. Given that the NPS routinely flies within flight-free zones and below the rim (in particular the crowded Bright Angel flight free zone), it is reasonable to assume that the NPS' flights generate a disproportionate percentage of complaints about aircraft noise. Incredibly, the FAA makes the unsupported and unsupportable statement that "the amount of noise produced by these aircraft is very small compared to that of commercial air tour aircraft." Federal Register, Vol. 64, page 373 12. Given the high impact of NPS' flights, it is unreasonable to assume they have no impact on visitors.

In light of the foregoing, Grand Canyon Airlines believes it is entirely inappropriate to base serial rulemakings on the faulty premises constructed by the NPS and the FAA.

III. The Proposed Rule Violates Executive Order 12866

The present administration enacted Executive Order 12866 in 1993. One stated purpose of the rule was to ensure regulatory approaches "maximize net benefits" to society and not impose "unreasonable costs on society." To continue with the proposed rule in light of the enormous costs and minimal benefits from the rule flies in the face of Executive Order 12866.

The FAA must either withdraw their ill-conceived rule or the stated concern for citizens and society in the Executive Order will be shown to be a farce.

A. The FAA has significantly understated the costs of the proposed rules.

Executive Order 12866 mandates a cost/benefit analysis of a proposed rule. For the reasons set forth below, the FAA has significantly understated the societal costs that would result from the proposed rule.

1. The FAA's limits on flights would deprive many customers of a view of the GCNP resulting in a significant loss of consumer surplus.

The proposed rule would limit commercial air tours to a level far below what is currently being conducted. This restriction would greatly decrease the number of visitors that would be afforded a view of the remote backcountry of the GCNP. The visitors denied an air tour would presumably not be able to enjoy the backcountry since other visitors to the backcountry (backpackers or river tour visitors) must obtain permits that are limited in number. The **FAA** makes a big deal out of the increase in "consumer surplus" enjoyed by backcountry ground visitors from restrictions on air flights but totally ignores the "consumer surplus" lost by denying air tours to thousands of customers.

Significantly, the lost tours represent a total loss of consumer surplus that would have been enjoyed by air tour customers while the increased consumer surplus to ground visitors from air tour restrictions is at best marginal. Because of restrictions on the number of ground visitors in the backcountry (as well as physical restrictions such as age and disability that prevent some air tour passengers from ground visits to the backcountry), this consumer surplus would not likely be recouped from increased ground tours. Ironically, many backcountry visitors may have their "consumer surplus" lost as their access is crowded out by people denied air tours. It is not

appropriate to favor one category of visitor over another in these circumstances. Decreasing low impact air tour visitors while maintaining high impact ground tours is not a recipe for increasing total visitor enjoyment. It also violates the NPS mandate to make the GCNP accessible to all. Total societal benefit is clearly diminished by the proposed rule.

2. Displacing air tour customers would lead to an increase of high-impact ground visitors to the backcountry areas of the GCNP.

Backpacking and river tour visitors have a significant impact on the GCNP. Consequently, their numbers are controlled and limited. Ironically, limiting air tours is likely to have an overall negative impact on the environment at the GNCP. Air tours represent the easiest way for visitors to experience the backcountry without having a large impact on the GCNP. Decreasing air tours that have a low impact on the environment creates an incentive for these individuals to become high impact ground visitors to the backcountry. As such, they would have a much greater negative effect on the environment at the GCNP.

B. The FAA has significantly overstated the benefits of the proposed rule.

Executive Order 12866 mandates a cost/benefit analysis of a proposed rule. For the reasons set forth below, the FAA has significantly overestimated the societal benefits that would result from the proposed rule.

1. Studies by the NPS' own experts suggest that increased consumer surplus from limitations on air tours is minimal.

In the NPRM, the FAA asserts that imposition of limits on air tours will likely result in an increase of approximately $35,000,000 in increased enjoyment ("consumer surplus") to ground visitors to the GCNP. Such number is a grossly inflated estimate of societal benefits from the new restrictions as will be shown below. However, laying aside the accuracy of this estimate,

this number is small compared to the lowest estimate of the increased costs from the rule that the FAA admits will be incurred ($114.6 Million).

2. Data from the GCNP visitor survey suggests that increased consumer surplus from limiting air tours is vastly overstated.

In calculating the societal benefits from the new proposed limits on air tours, the FAA assumes that noise from air tours causes a diminution in a ground visitor's consumer surplus of between 0 and 100 %. The FAA assumes that respondents indicating they were slightly annoyed by aircraft noise had their consumer surplus (enjoyment) diminished by twenty percent (20%). Those "moderately," "very much," and "extremely" annoyed by aircraft noise had their consumer surplus diminished by 40, 60 and 80% respectively. These simplistic assumptions defy reason and appear to be nothing more than a feigned attempt to comply with the requirements of Executive Order 12866 mandating a cost/benefit analysis. For several obvious reasons, the FAA has vastly overstated the supposed benefits of the new limits on air tours.

First, the FAA's analysis suggests that the GCNP is experienced primarily by auditory means and that the enjoyment derived by visitors to GCNP is primarily a function of the audible experience of the visitors. This is plainly nonsense. The marvelous vistas offered by the GCNP are obviously a much bigger factor in visitor enjoyment than is their auditory experience. These vistas are unaffected by aircraft intrusions. Furthermore, air tour passengers to the GCNP do not experience the park in an auditory manner and derive their enjoyment through visual means.

Second, the FAA ignores the fact that intrusions by aircraft noise were relatively short in duration and few in number. The Harris Miller Miller & Hanson, Inc. ("HMMH") study (the "Study") cited by the FAA in the proposed rule contains detailed information that refutes the significant impact on visitor enjoyment posited by the FAA. First, on Page 9 of the December 13, 1993 report by HMMH, HMMH states that a typical aircraft event is audible for

approximately four minutes. HMMH also reported that the average visitor heard between .6 and 4.3 aircraft per day. At worst case, this means that a visitor may hear an aircraft for approximately 17 minutes. It is beyond belief that FAA would argue that a person who hears aircraft for approximately 17 minutes (or less in most cases) per day would have most of his or her enjoyment of the GCNP lost. Furthermore, the HMMH study also indicated that the average visitor indicated that somewhere between 4 and 20 times as many aircraft events per day than were actually heard would still be an acceptable level of noise. See graph attached as Exhibit . "A." If many more flights than were actually heard would still have been "acceptable," it is safe to conclude that the low level of flights actually heard had minimal, if any, impact on visitor enjoyment.

Clearly, the FAA has taken considerable license in extrapolating societal benefits from the new limitations on air tours. Viewed as a whole, the HMMH data suggests marginal, if any, increased enjoyment from restrictions on air tours. In light of the foregoing, it is reasonable to conclude that the actual societal benefits from the proposed restrictions would be no more than a small fraction of that estimated by the FAA.

Finally, as noted above, there is no clear evidence that the aircraft noise complained of was created by air tour aircraft. To the extent that the aircraft noise was caused by NPS' flights (which are significant within flight free zones) or large commercial jet air carrier flights other than air tours, limiting air tours would do nothing to increase visitor enjoyment or consumer surplus. Clearly, they are intended to merely punish air tour operators and allow the NPS to assert control over the airspace over the GCNP.

3. The FAA's economic analysis of "benefits" from the proposed rule is scientifically flawed.

At the public hearing on the proposed rules held in Las Vegas, Nevada on August 18, 1999, two economists from the University of Nevada Las Vegas, Keith Schwer and Mary Riddel, submitted comments critical of the scientific method employed by the FAA in valuing likely societal benefits from the new restrictions. Grand Canyon Airlines incorporates these comments by reference. These comments clearly refute the sloppy scientific method employed by the FAA and expose it as a sham.

C. The costs of the proposed rule significantly outweigh any benefits of the proposed rule.

In light of the foregoing, it is obvious that the proposed rules would impose significant costs on both air tour operators and society while generating little or no benefit to society. The rules serve only to satisfy extremists who wish to restrict citizens' access to the GCNP. The FAA's intellectually dishonest analysis of the data suggests that it is merely attempting to justify a preordained conclusion dictated by a narrow constituency. The data does not support the conclusions drawn by the FAA. Rather, the data clearly suggests that societal benefits would likely be maximized by large increases in air tours over the GCNP. To proceed with the proposed rules in the face of the clear detriment to society would expose as a sham the Clinton Administration's pretended concern over the cost of federal regulation. The proposed rules are clearly arbitrary and capricious.

IV. The Proposed Rule Will Have a Significant Adverse Impact on Small Businesses

The Regulatory Flexibility Act requires agencies to analyze the economic effect of regulatory changes on small businesses. In this section we will discuss the impact of the proposed rule on air tour operators in general and Grand Canyon Airlines in particular.

A. The proposed cap on flights is derived from a base period during which the market for Grand Canyon air tours was depressed.

The NPRM proposes limits on air tours based on the number of flights that occurred during the period from May 1, 1997 to April 30, 1998. Grand Canyon Airlines opposes the use of this baseline since the period in question is not representative of Grand Canyon Airlines typical operations. Grand Canyon Airlines and other air tour operators had a lower level of operations during this period and in the year prior due to a recession in Asia that impacted many visitors to the Southwest United States. Set forth on Exhibit "B" hereto is a record of the number of air tours conducted by Grand Canyon Airlines in recent years. As can be seen from this Exhibit, recent years' operations do not reflect Grand Canyon Airlines typical operating levels.

B. The proposed allocations are too small to allow air tour operators to cover substantial fixed expenses and operate profitably.

The air tour industry has naturally high fixed operating costs that cannot be easily avoided when a downturn in business occurs. Large capital costs for aircraft are typical. Restrictions on the amount of use that can be made of these aircraft cause a severe hardship on air tour operators. Other hard to avoid costs include employment costs, rent and/or investments in terminals and hangars. Restricting business activity of companies with high embedded costs is likely to result in making such companies unprofitable.

Grand Canyon Airlines reasonably projects that it would not be able to operate profitably under the new flight restrictions. Grand Canyon Airlines has maintained detailed data for its revenues, fixed costs and operating costs over the years relating to air tour operations. Attached hereto as Exhibit "C" is a summary of Grand Canyon Airlines revenues and costs from its air tour operations for 1998. This Exhibit details a significant loss for 1998 (which includes a portion of the base year period used by the FAA). Grand Canyon Airlines believes that these

figures are a reasonable approximation of Grand Canyon Airlines operating results after imposition of flight caps that errs on the optimistic side. Consequently, the 1998 results are a reasonable projection of operating results under the new flight restrictions proposed by the FAA. The notes to Exhibit "C" also detail reasons why a cap on flights is likely to result in operators actually flying fewer flights than allowed by the cap. The air tour business is subject to many fluctuations that are a function of weather, customer demand, tourism activity and other factors. These factors cause operating levels to fluctuate significantly. Furthermore, because of an air . tour operators desire to maintain the employment of its employees and remain a presence in the market, it will likely hold back allocations to keep its operation going year round. This increases the likelihood that the other factors effecting short term demand will result in unused allocations at year end. In short, the flight restrictions severely restrict air tour operators' operating flexibility and complicate operations unnecessarily.

The FAA posits that air tour operators can offset lost revenue from flight limitations by raising prices. This statement is unsupported with any factual data or reasoned economic analysis. In fact, demand for air tours has always been highly elastic. The large number of operators makes pricing very competitive. When air tour traffic fell in 1997 and 1998, air tour operators were not able to raise prices on a smaller base of business. No data supports the FAA assertion that prices can be easily raised.

The FAA also states that air tour operators can move excess aircraft to other uses. This is obviously true. However, it does not follow that they can do so without incurring large losses from the redeployment. Grand Canyon Airlines has retrofitted aircraft specifically for sight-seeing purposes. Diverting its planes for other uses would surely result in a loss of the significant retrofit investments made by Grand Canyon Airlines. See Exhibit "D" attached

hereto. Furthermore, Grand Canyon Airlines would likely incur additional losses in refitting its planes for other uses.

It is also wrong to assert that air tour operators could deploy sight-seeing aircraft in other areas for sight-seeing purposes. No other U.S. destination attracts the number of air tour visitors as does the GCNP. Moreover, the federal government has adopted restrictions on air tours in Hawaii and over the Rocky Mountain National Park while hinting at further restrictions elsewhere. Redeploying sight-seeing aircraft in which they have made a significant investment will result in large losses to Grand Canyon Airlines.

c. **The proposed rule will likely put Grand Canyon Airlines out of business.**

As detailed in Exhibit "C," the level of operations allowed by the proposed rule would cause Grand Canyon Airlines to sustain significant losses. Grand Canyon Airlines reasonably estimates that it would lose approximately three-quarters of a million dollars per year if the restrictions are put in place. In light of the proposed rule's limits on air tours, it is probable that these losses would be incurred on an ongoing basis. Grand Canyon Airlines and other air tour operators have been able to adapt their operations to some degree to prior rulemakings under Public Law 100-9 1. The latest proposal, however, is a different animal that will have a lasting and detrimental impact on air tour operators. There is no way to get customers to pay for air tours that do not actually occur. The end result of the latest proposed rule would be to cause Grand Canyon Airlines and other long time air tour operators to incur significant, ongoing losses that would force them to go out of business. This in turn will lead to some GCNP visitors being denied a view of backcountry vistas through air tours.

V. Repeated rulemaking regarding the Special Flight Rules Area makes it impossible for air tour operators to plan effectively.

The first two pages of the NPRM detail repeated rulemaking efforts under Public Law 100-9 1. Some of these resulted in final rules while others have been withdrawn or delayed. Other proposed rules under Public Law 100-9 1 were also proposed and then withdrawn. The NPRM also forecasts additional rulemakings on a variety of topics including "quiet aircraft technology initiatives" and a "Comprehensive Noise Management Plan." Federal Register, Vol. 64, p. 37308. This illustrates that air tour operators have had to operate in an environment of uncertainty. The never-ending circle of new rules on different topics makes it impossible for Grand Canyon Airlines and other air tour operators to rationally plan for their businesses as discussed in more detail below. In particular, promulgation and withdrawal of numerous proposed rules relating to air tours at the GCNP has given uncertain signals to air tour operators and has penalized operators making past investment in quiet aircraft.

On December 3 1, 1996, the FAA promulgated regulations categorizing air tour aircraft into three different categories based on the noise profile generated by the various aircraft. Among other things, the FAA proposed phasing out certain of the aircraft. On December 3 1, 1996, the FAA proposed new air tour routes, some of which were to be available to only the quietest aircraft. One of these routes was a new route traversing the Bright Angel Flight Free Zone which Grand Canyon Airlines has utilized since 1987. Grand Canyon Airlines and others provided significant comments on these proposed rules. Notwithstanding the significant effort expended in addressing the proposed rules, the FAA withdrew its proposed rule classifying various aircraft according to their noise profiles. Furthermore, in the present proposal, the FAA declares its intention to eliminate (at least temporarily) the route through the Bright Angel Flight

Free Zone to the detriment of carriers such as Grand Canyon Airlines who have relied on said route.

The NPRM states that "the FAA and NPS realize that commercial air tour operators need consistency to justify equipment investment and make other business plans." This is an empty acknowledgment belied by their actions. The FAA proposed categories of aircraft to create an incentive to purchase quieter but more expensive aircraft. It then withdrew this rule (after significant additional investments in larger, quieter aircraft were made) and now promises a new "Comprehensive Noise Management Plan" and quiet aircraft technology initiatives that will change the regulatory landscape yet again but not before two more years after the restrictions set forth in Notice 99-12 are promulgated. Furthermore, the FAA proposes that the new allocations will remain in place for "two years" after which they may be eliminated or reduced further. Contrary to actually encouraging investment in quiet aircraft technology, the new rules insure that no new investments will be made. No air tour operator can recoup capital investments in two years or continue to lose money and no air tour operator would make significant new capital investments in the current regulatory landscape.

Ironically, the new rules limiting air tours have the effect of penalizing the few air tour operators who have made significant investments in quieter aircraft. As detailed in the balance sheet portion of Exhibit "C," Grand Canyon Airlines has invested in fixed assets valued at over $7.6 million dollars. Grand Canyon Airlines and a few other operators have made investments in aircraft that were recognized by the FAA as investments in preferred technology (see Notice 96-14). These investments result in Grand Canyon Airlines having a capital investment per seat that is many times higher than those of carriers using louder aircraft.* Ironically, the proposed

[2] In 1998 dollars, a Cessna 207 typically costs $75,000-125,000 and therefore has a per seat cost of $12,000-21,000. A DHC-6 Vistaliner typically costs $1,100,000-1,300,000 and seats 19 for a per seat cost of $58,000-68,000.

limitation on air tours has a larger adverse effect on the air tour operators who have made significant investments in quiet aircraft. As noted above, the limitation on air tours will have a large impact on operators with high fixed costs. Its higher fixed costs associated with investments in quieter aircraft make it more likely that Grand Canyon Airlines and other similarly situated air tour operators with high embedded costs will suffer disproportionately from the limitations on air tours. This makes it clear that the FAA and NPS' aim is not to encourage investment in quiet aircraft. With the quiet and efficient carriers out of the way, the operators flying louder aircraft will be easily regulated out of business.

The proposed rules make it clear that the carriers with the lowest capital costs per seat will rule the skies over the GCNP. The proposed rules actually create a perverse incentive for carriers to dump more expensive quiet aircraft technology and operate with cheaper, noisier aircraft. The proposed rules are counterproductive to the FAA and NPS' stated goals. Apparently, the FAA and NPS are more concerned with punishing air tour operators and driving them out of business.

VI. The Incentive Corridor for the Bright Angel Flight Free Zone Should Be Immediately Available

As noted above, the FAA previously approved a route through the Bright Angel Flight Free Zone in 1997. The FAA now proposes in Notice No. 99-11 to eliminate this route pending development of standards for quiet aircraft technology. For the reasons set forth below, the FAA should retain the Bright Angel incentive route at present.

A. Air tour operators should not be penalized for the FAA's failure to promulgate "standards" for quiet aircraft.

The delay in promulgating standards for quiet aircraft has to be laid at the feet of the FAA. The FAA previously adopted standards for quiet aircraft but then inexplicably withdrew

the same after receiving public comments. In fact, the FAA has determined that many air tour operators are already deploying the quietest aircraft available. Recognizing this fact, the FAA (a) withdrew the prior NPRM on aircraft classification, (b) promulgated a nonsensical new standard for "natural quiet" (ambient sound minus eight decibels), and (c) promised to develop new standards for quiet aircraft within two years. Undoubtedly, this new standard will not be met by currently available technology.

When the Bright Angel corridor was proposed in Notice No. 97-6, the FAA indicated that the corridor would be available to the "most noise efficient aircraft." Grand Canyon Airlines' aircraft certainly met this test. Grand Canyon Airlines' Vistaliners are designed to fly at lower speeds (thereby lowering by two thirds the audibility of the Vistaliner over that of an unmodified Twin Otter from which the Vistaliner is derived and confirmed by actual Department of Transportation sound testing) and fly 19 passengers per flight. Notice No. 96- 15 (now withdrawn) recognized that the Vistaliners flown by Grand Canyon Airlines qualified for the quietest category of air tour aircraft. This advantage of the Vistaliner is not insignificant--other aircraft have smaller payloads and must fly at greater horsepower settings and propeller RPMs (Vistaliner @1562 RPM and Cessna 207 @2450 RPM). The combined effect of the rules proposed pursuant to Notice Nos. 99- 11 and 99-l 2 is to impose a disproportionate burden on air tour operators that have made investment in quieter aircraft.

The FAA's statement that closing the Bright Angel Corridor will give operators an "incentive" to convert to quieter aircraft in the future. This statement is not true for operators such as Grand Canyon Airlines that have already invested in the quietest aircraft available. There can be little question that whatever standard for quiet aircraft is eventually adopted, the Vistaliner will qualify as quiet aircraft technology. The FAA would have to adopt standards

disqualifying all current technology for the Vistaliner to not qualify as a quiet aircraft. It would be unreasonable to expect the air tour industry with its limited resources and revenues to pay the development cost of quieter aircraft that do not now exist. Consequently, a reasonable person must conclude that at least a few current operators have already invested in the quietest technology available and should be allowed to continue to use the existing Bright Angel corridor.

B. The FAA admits that significant benefits will accrue from immediate availability of a corridor through the Bright Angel Flight Free Zone.

The NPRM admits that immediate benefits would accrue from making the Bright Angel corridor available at present. See Federal Register, Vol. 64, p. 37297. These benefits include preserving quiet over the Saddle Mountain Wilderness Area and dispersing traffic over two routes to avoid a concentration of traffic. Furthermore, the Bright Angel corridor would improve flight safety at GCNP by giving air tour operators the ability to fly a safer route at a lower altitude. These benefits alone justify making this corridor available at present. The cost of flying over the incentive corridor is minimal since the North Rim of the GCNP is closed to ground visitation due to snow and weather conditions from October 15-May 15 of each year.

C. The route over the Saddle Mountain Wilderness Area unnecessarily increases operating costs for air tour operators.

The route over the Saddle Mountain Wilderness Area requires air tour operators to fly a longer route (that is not more appealing to air tour customers) over higher terrain. This needlessly increases the cost of an air tour while providing no incremental benefit to air tour customers. Grand Canyon Airlines has determined that the longer route increases aircraft direct operating costs by $91.72 per flight (20% over current direct operating costs) and requires it to carry an additional 130 pounds of fuel (therefore 130 pounds less available for paying passengers). This significantly increases Grand Canyon Airlines operating costs and increases

the chance that it may have to restrict passenger numbers in light of the additional fuel carried on the longer route.

VII. The Proposed Limitation on Air Tours Would Negatively Impact International Trade

The proposed rule states that "This NPRM would not have a significant impact on international trade. This statement is incorrect. It is true that the rule may not materially affect the sale of goods by U.S. businesses. However, the rule does materially impact the sale of services to foreign tourists. It is common knowledge that the United States has for a long period had a sustained goods trade deficit with foreign countries. It is also true, however, that the United States has long had a services surplus with foreign countries. These services include the sale of financial products, insurance and, importantly, the sale of services to tourist. The United States surplus in the services economy has been an important factor in ameliorating the effect of the goods trade deficit sustained by the United States. The GCNP is a unique world class destination that draws visitors from around the world. The proposed limitations would severely limit air tours, a large percentage of which have traditionally been sold to foreign tourists. Fifty percent of Grand Canyon Airlines passengers and ninety percent of Las Vegas based carriers' passengers are foreigners, many of whom have come specifically to visit the Grand Canyon by air due to the accessibility air tours provide. Clearly, the impact on foreign trade by limits on air tours would be significant. Inexplicably, the NPRM fails to address this point. This point is also made by UNLV's Riddel and Schwer in their comments made at the public hearing in Las Vegas.

VIII. Response to Specific FM Inquiry

The FAA specifically requested response to "Specific Matters for Comment" at pages 373 11 and 373 12 in Vol. 64 No. 13 1 of the Federal Register. Grand Canyon Airlines responds specifically to the FAA's request as follows:

(1) No peak season should be used for purposes of assigning allocations.

(2) No report should be needed if the ridiculous limitations on air tours is not pursued. If allocations are imposed, Mountain Standard Time should be used.

(3) No position.

(4) 180 days is acceptable as long as the clock is not running while an operator is out of allocations for a given year or period.

(5) The original allocations do not reflect business operations as of the date of Notice 99-12.

(6) The allocations should not be imposed, particularly for quiet aircraft. If imposed, they should be guaranteed not to decrease in perpetuity. They should be increased for operators investing in quiet aircraft technology such as Grand Canyon Airlines.

Additionally, in order to allow operators some operating flexibility, operators should be able to carry over some number of allocations from one year to the next year or borrow some number of allocations from future years. Alternatively, the FAA should allow small overages to accommodate continuity of business operations. This would assist operators in avoiding interruptions in service. It would also help operators avoid layoffs and allow them to better retain qualified employees.

IX. Incorporation of Prior Comments.

Grand Canyon Airlines has previously made comments on rules proposed under Public Law 100-91. Those comments are incorporated herein by reference and some of them are attached hereto as Exhibit E. Grand Canyon Airlines believes the current rulemaking is beyond the scope of the authority granted by Public Law 100-91 to the FAA and NPS for the reasons cited in its comments (and the comments of the Grand Canyon Air Tour Council) to the rules proposed in Docket No. 28537, Notice No. 96-l 1.

X. Summary

The facts and arguments set forth hereinabove establish that there is no rational basis for the rules proposed in Notices 99-l 1 and 99-12. Even the Superintendent of the GCNP admits that new rules cannot be justified as a response to visitor complaints. Political pressure is no excuse for departing from traditional rulemaking norms or the intent of enabling legislation. Furthermore, the Presidential Memorandum cited by the FAA as a reason for proceeding with new rules does not have the force of law. The arguments and rationales advanced by the FAA for the new proposed rules are ridiculous and do not stand up to scrutiny. Proceeding with these ill-advised rules would be an arbitrary and capricious action that has no rational basis. Grand Canyon Airlines urges you not to proceed with them.

Respectfully submitted.

WOODS & ERICKSON

By: 

R. Glen Woods
John R. Erickson
2920 N. Green Valley Parkway, Suite 424'
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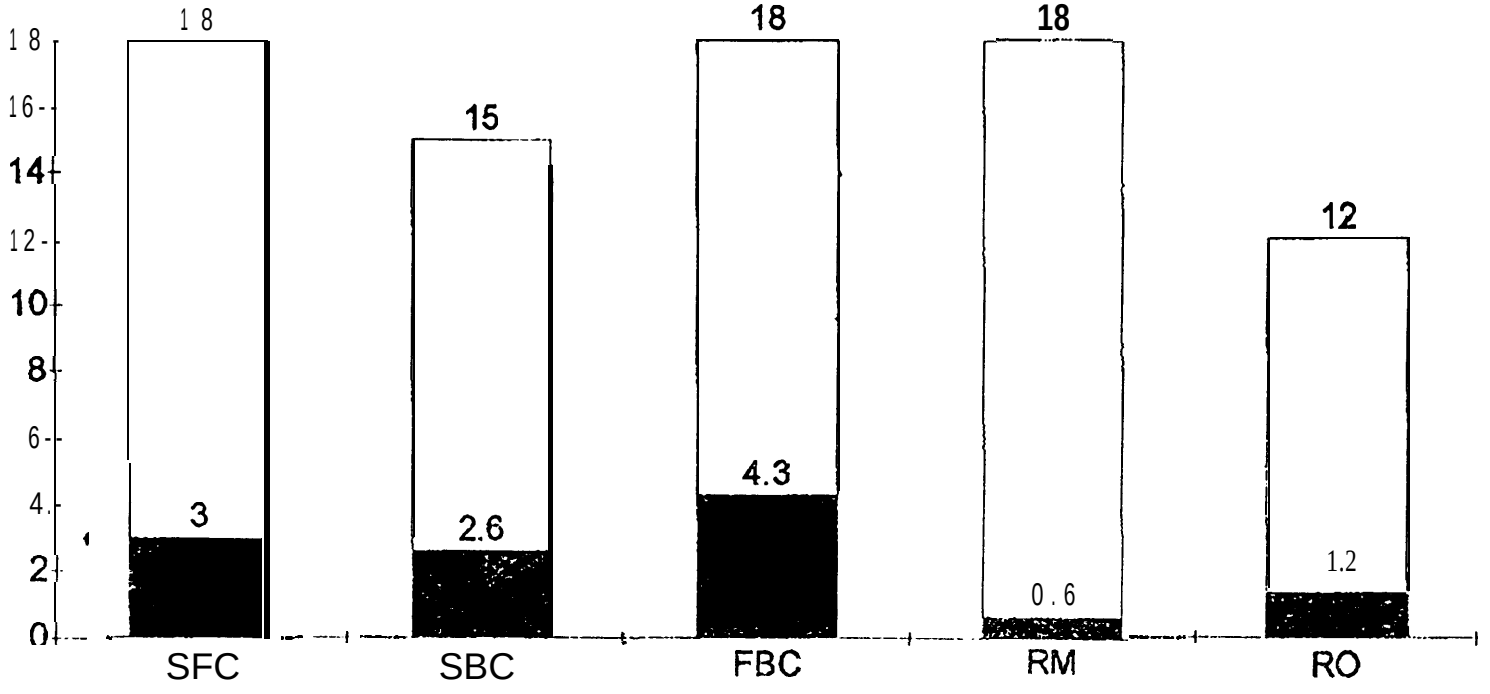
(702) 433-9696

Exhibit “A”

See Attached

ACTUAL NUMBER OF AIRCRAFT EVENTS/24 HOURS (BLACK) VERSUS ACCEPTABLE NUMBER OF EVENTS PER HMMH INTERVIEWS



SOURCE		SUMMER FRONT CNTRY	SUMMER BACK CNTRY	FALL BACK COUNTRY	RIVER MOTOR POWERED	RIVER OAR POWERED
1	AVG TOTAL/TRIP HEARD	3.	--	10.	4.	12
2	AVG OF VISIT (DAYS)	<1 DAY	1.9	2.3	6.5	10.3
	AVG HEARD/DAY	3.	15.	4.3	0.6	1.2
3	STANDARD TABLE	18.	12.4/day	18.	18.	12.
	REMAINING TO REACH MAX STD	15/DAY		13.7/day	17.4/day	10.7/day
	% OF STANDARDIZED CAPACITY	17%	17%	24%	3%	11%

Exhibit “B”

See Attached

GRAND CANYON AIRLINES
AIR TOUR FLIGHTS FLOWN
1988-1998

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
JAN	52	59	69	80	83	88	159	121	121	57	88
FEB	74	102	85	161	81	133	133	190	124	88	70
MAR	220	320	204	278	205	396	413	274	254	204	165
APR	305	392	419	424	580	642	411	394	362	189	256
MAY	581	632	516	572	630	701	561	565	369	348	404
JUN	662	635	595	568	690	768	730	575	431	375	455
JUL	786	861	715	793	876	971	950	846	614	466	539
AUG	792	837	738	860	931	964	954	907	726	490	450
SEP	626	636	618	656	790	711	620	647	572	385	314
OCT	443	478	473	556	584	502	493	467	365	282	249
NOV	157	171	152	176	225	215	199	232	167	154	95
DEC	57	114	101	96	125	176	173	140	124	86	109
TOTALS	4,755	5,237	4,685	5,220	5,800	6,267	5,796	5,358	4.229	3.124	3,194

(BOLD NUMBERS INDICATE AVERAGES USED. ACTUAL DATA WAS NOT AVAILABLE)

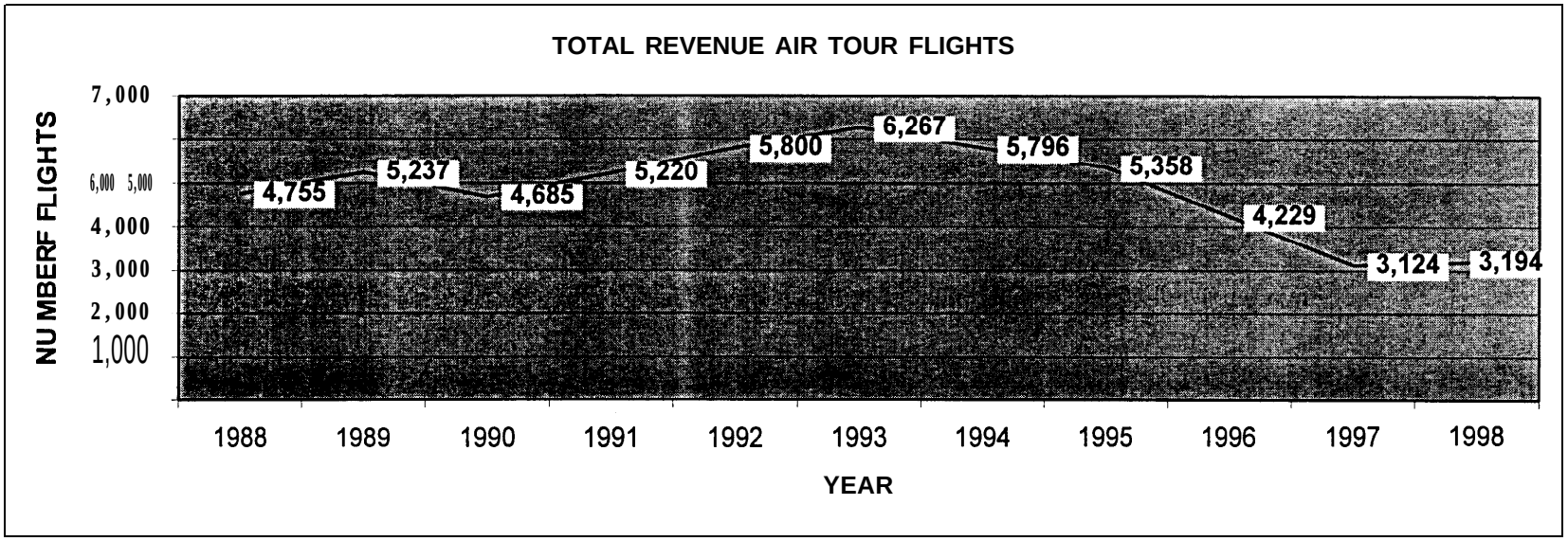


Exhibit "C"

1998 P & L Detail

REVENUE DETAILS		(Actual)
Revenue Flights		3,270 flts
Revenue Passengers		49,558 pax
Air Tour Revenues		$2,938,100
Revenue Per Flight		$ 898.50
Revenue Per Passenger		$ 57.85
TOTAL DIRECT OPERATING COSTS (DOC)		$1,499,900
DOC per Flight		$458.69
FIXED COSTS/AIR TOUR OPERATIONS		
(1) Wages & Benefits		$544,000
(2) G & A		$264,500
(3) Other Fixed		804.600
	Total Fixed	$1,613,100

CALCULATION OF PROFIT/ < LOSS >
1993/98 GCA AIR TOUR FLIGHTS
CONSTANT 1998 DOLLARS

		Rev. Flights	Total Flt Revenues	Total Fixed Exp	DOC Expense	Profit/ < Loss >
1998	actual	3,270	$2,938.1	$1,613.1	$1,499.9	<$174.9>
1997	FAA Base	3,165	2,843.8	1,613.1	1451.8	<221.1>
1997	actual	3,124	2,806.9	1,613.1	1,432.9	<239.1>
1996	actual	4,229	3,799.8	1,613.1	1,939.8	246.9
1995	actual	5,358	4,814.2	1,613.1	2,457.7	743.4
1994	actual	5,796	5,207.7	1,613.1	2,658.6	936.0
1993	actual	6,267	5,630.9	1,613.1	2,874.6	1,143.2

(1) Actual revenue flights in each calendar year except FAA base year 5-l-97 - 4-30-98

FINANCIAL IMPACTS STEMMING FROM CHANGES IN GCA's AIR TOUR ROUTES

ASSUMPTIONS

GCA Base Allocation	3,165 air tour flights
Revenue per flight	$ 898.50
Revenue per passenger	$57.85
DOC per flight	$458.69
Net Revenue contribution (Revenue per flight less DOC expense)	$439.81

(1) Black 1 air tour route extended to northern park boundary adding 20% more miles to route than current.

1998 DOC/Flight x 120% = Longer Route DOC

$458.69 x 120% = $550.41 = $91.72 in increased Direct Operating Costs

(2) Inability to use 100% FAA Base allocation of flights. Unlike IFR slots at high density airports, air tour flights activities cannot be predicted due to weather, availability of passengers. GCA will have to ration its base if 3165 flights each month, perhaps turning business away in April-May-June in order to hold on to enough base for October-November-December. If base is totally used up by October 15, then GCA must shut down until January 1, of the following year disrupting employment and confusing its customers that flights may or may not be available. Thus GCA will have to ration its flight allocation conservatively with the likelihood that not all its base of 3,165, gets used particularly as weather is a significant and unpredictable factor in ability to fly in November and December. GCA will assume that 65 flights of its 3165 allocations will have to be held back as good business planning.

(3) Reduction in Revenue flights due to increased weather cancellations. The extended Black 1 route will require GCA to fly over higher terrain which will cause GCA to cancel more flights due to weather than now. This has two components of impact. First it will cost GCA the loss in net revenue (Gross Flight Revenues less DOC expense) for flights not flown (and not

recoverable). Second, by making the Zuni corridor one way only, GCA will not be able to offer the alternative round trip Zuni air tour when weather conditions are adequate for the Zuni tour but not flight over north rim route. Weather is a factor at the Grand Canyon year round and it may be necessary to cancel flights due to ceilings and visibilities as well as high winds and or moderate to severe turbulence.

For this analysis GCA will assume that an additional 150 air tour flights will be cancelled each year that are not otherwise recoverable by delaying passengers to later flights where weather has improved.

Currently GCA can offer the Zuni alternative air tour 15% of the time it cannot operate over the North rim. This alternative tour would be lost entirely since round trip Zuni flights would be prohibited and the option of returning to GCN airport to the east of the Desert View Flight Free Zone would not be marketable. Thus GCA will lose the net revenue contributions of 50 alternative weather flight tours in the Zuni annually.

(4) Reduction in useful Load (passengers) due to increased fuel requirements for extended Black 1 route. The 20% longer Black 1 will require 130 pounds of additional fuel for the trip. This reduces the passenger payload by an equivalent 130 pounds which affects Revenue generated per flight, but not DOC expense.

Since the average GCA passenger weighs 170 pounds, this reduction in payload is equivalent to .76 revenue passengers per flight (130/ 170 = .76). In addition, the so called "drift down rule" (cannot load an airplane heavier then its ability to maintain altitude in the event of one engine shut down) will also restrict pay loads since the extended Black 1 route will require flying 500 feet higher to clear the higher altitudes increase in tour route altitude over present routes.

Drift down cost impact is virtually impossible to calculate since it also is dependent on ambient density altitude which is not predictable or calculable.

(5) Certain increased costs cannot be passed on the GCA's passengers as FAA predicts in the rule making. GCA's principal competitions are helicopter air tour companies based at Grand Canyon. GCA's tour price is $75 .OO versus $99.00 for the helicopters. GCA has steadily lost market share since FAA approved the short (but more expensive) Dragon tour for helicopters, but not fixed wing aircraft. The $25 difference is not enough to induce potential GCA passengers to . fly the fixed wing tour instead of a combo helicopter experience/air tour. Flight helicopters also operate at lower altitudes for better canyon viewing and can fly substantially more flights due to shortness of tour. They are far less subject to flight cancellation due to weather than north rim fixed wing flights so they can fly when GCA cannot. If GCA could pass on an additional $25 to its customers it would have already done so,

Now taking these factors into consideration, the following calculations can be made.

1997 FAA Base year loss from page 26 <$221.1>

(1) 20% increase in DOC

3100 flights x $91.72 in DOC = <$284.3>

(2) Inability to generate Net Revenues over operating expense for 65 flights not flown due to inability to plan for 100 percent utilization of allocation 65 x $439.8 1 = <$28.6>

(3) Weather cancellations - lost flight net revenues 150 flights

- 439.81 x 150 = <$66.0> in less revenue.

No alternative weather tour using Zuni when Black 1 is not open.

50 flights x $439.81 = < $22.0 >

(4) Reduction in useful load due to 130 pounds more fuel, equivalent to .76 less passenger per flight.

$57.85 x 3100 x .76 = < $136.3 > less passenger revenues annually

SUMMARY

	000's
(1) Base year loss	< $221.1 >
(2) Increased DOC	< 284.3 >
(3) Unused Allocation	< 28.6 >
(4) Weather Cancellations Increase	< 66.0 >
(5) No Alternative Weather Tour	< 22.0 >
(6) Reduction in Payload	< 136.3 >
TOTAL LOSS FOR BASE ALLOCATION ADJUSTED FOR ROUTE CHANGES PROPOSED	< $758.3 >

BALANCE SHEET
GRAND CANYON AIRLINES
AIR TOUR OPERATIONS

	(000s)
Inventory	1,226.8
Aircraft	4,417.3
Terminal	901.6
Equipment	270.0
Furniture	77.8
Canyon Pines	426.2
Mobile Home	383.8
Total	7,703.5

Exhibit “D”

See Attached

The Engineering Society For Advancing Mobility Land Sea Air and Space

400 COMMONWEALTH DRIVE WARRENDALE, PA 15096

SAE Technical Paper Series

871034

Measured Sound Levels of the Raisbeck Quiet Turbofan Propellers on Medium-Twin Aircraft

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Raisbeck Engineering, Inc.
John F. Mills
BBN Laboratories

General Aviation Aircraft Meeting and Exposition
Wichita, Kansas
April 28-30, 1987

ISSN 0148-7191

871034

Measured Sound Levels of the Raisbeck Quiet Turbofan Propellers on Medium-Twin Aircraft

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Raisbeck Engineering, Inc.
John F. Mills
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ABSTRACT

Judicious application of state-of-the-art technologies in aerodynamics and materials has been coupled with newly available CAD/CAM techniques in engine/propeller/airframe integrations to bring about a new class of propellers for general aviation turboprop twins. These new propellers, coined "Quiet Turbofans," are being retrofitted to today's currently flying general aviation turboprop aircraft, measurably reducing total airplane noise and uibration.

This paper details the results of two distinct applications of these technologies. The Raisbmck Quiet Turbofan System, manufactured by Hartzell Propeller Products, has brought about certified reductions In FAR Part 36 flyover sound levels of approximately 5 dBA for the Beechcraft Super King Air 200/B200 and the deHavilland of Canada DHC-6-300 Twin Otter. Associated cabin and cockpit sound levels have been reduced 7 to 13 dBA, while at the same time increasing the overall performance of these aircraft.

Future applications at the new aircraft design level allow virtual elimination of propeller noise and vibration a6 overriding design considerations.

BACKGROUND

HISTORICAL INFORMATION CONCERNING the application of propeller design and manufacturing to the entire class of general aviation single and twin-engine aircraft has shown a consistent lack of engine/propeller/airframe integration. Many of these problems have been documented over the years through various SAE technical papers. One such report by H.V. Borst at the SAE General Aviation Technical Conference In 1981 summarized the problems.(1)

The large blockage effects of ill-tuned and round blade shanks on inlet air flow came to light at Ralsbeck Engineering during an early effort to increase the inlet ram air recovery for the PT6A engine as installed in the Beech Super King Air.

Subsequent to a design competition for quiet propellers on the military CI 2-F turboprop twin, Hartzell Propeller Products and Raisbeck Engineering joined in an extensive effort to optimize the performance gains available with four-bladed propeller technology while at the same time minimizing overall internal and external noise and vibration.

'Number in parentheses deeignatee reference at end of paper.

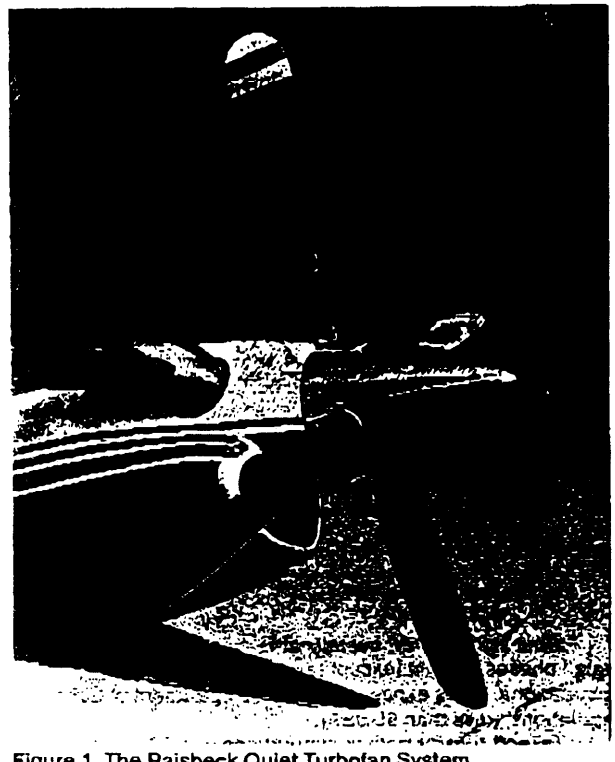

Figure 1. The Raisbeck Quiet Turbofan System

First civilian application of this technology occurred with the certification of the Raisbeck Quiet Turbofan System on the Beechcraft Super King Air family in February of 1985, Figure 1. Follow-on certifications have included the Beech King Air 90 series and the deHavilland Twin Otters. To date, more than 130 aircraft have been retrofitted.

MEASURED COCKPIT AND CABIN SOUND LEVELS — SUPER KING AIR

"Before" and "after" sound levels were measured In three different Super Klng Air 200s.

The "before" propeller was the standard Hartzell three bladed, of 98½ inches in diameter, with steel hub.

0148-7191/87/0428-1034$02.50

The "after" propeller was the new Quiet Turbofan, manufactured by Hartzell, with four blades, 94 inches in diameter, and with an aluminum hub.

Comparative characteristics are as shown in Figure 2.

A "General Radio Permissable Sound Level Meter and Analyzer" Model 1933 and a "General Radio Personal Noise Dosimeter" Type 1954 were used for most inflight interior measurements.

Specifications	3-Bladed Propeller	Quiet Turbofan
No. of Blades	3	4
Diameter	98.5"	94.0"
Blade Material	Aluminum	Aluminum
Hub Material	Steel	Aluminum
Total Installed Weight	140 lb.	151 lb.

Figure 2. Comparative characteristics.

Overall sound levels in the cabin are shown for both the old and new configuration In Figure 3 for a typical flight profile, from engine-start to shutdown. Overall noise levels were markedly reduced

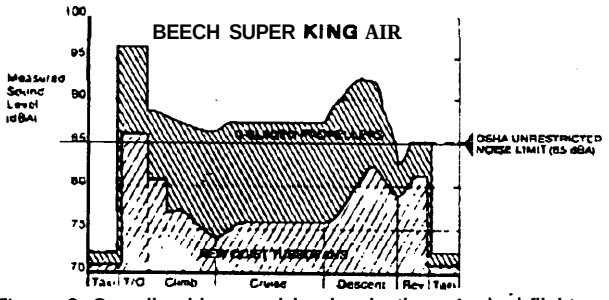

Figure 3. Overall cabin sound level reductions, typical flight

Most significantly, overall cabin noise was reduced during all phases of flight (except takeoff) to OSHA acceptable occupational noise exposure per U.S. Department of Labor regulations, (less than 85 dBA).

Takeoff rpm for both configurations was 2000, while cruise rpm for the Quiet Turbofans has been reduced from 1700 to 1600 rpm, in Figure 3.

Direct sound level comparisons at maximum cruise power at 1700 rpm and 31,000 feet altitude for the Super King Air are shown in Figure 4. Note that cockpit noise levels have been reduced approximately 7 dBA, which have allowed direct communication6 between crew members without electronic amplification or ear-pieces, increasing the overall operational safety levels of these aircraft-

The data in Figure 5 shows a discrete frequency breakdown of noise in decibels, from 31 .S to 16,000 Hertz. The octave bend analysis shows an overall reduction in sound level energy at all frequencies- the maximum sound level upward shift in frequency for the new Turbofans is due, no doubl to their multiple-blade configuration.

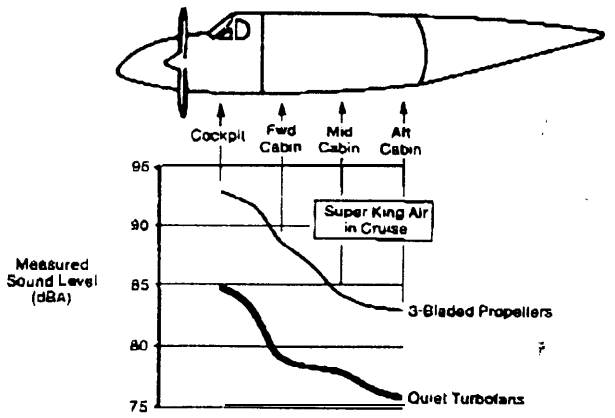

Figure 4. Cruise interior sound level reductions.

Frequency (Hertz)	Old Props	Quiet Turbofans
31.5	62 dB	76 dB
63	88	77
125	96	88
250	93	80
500	02	73
1000	74	66
2000	65	58
8000	58	52
	53	
16000	52	a ;

Figure 5. Comparison of descrete frequency noise energy distribution — Beech Super King Air.

MEASURED CABIN AND COCKPIT SOUND LEVELS — TWIN OTTER AND OTHERS

Similar interior sound level measurements were made in the deHavilland DHC-6-300 Twin Otter

The 'before" propeller was the standard Hartzell three-bladed propeller, 102 Inches in diameter, steel hub.

The 'after" Quiet Turbofan was four-bladed. 83 inches in diameter with aluminum hub.

The sound meter used for all measurements in Figure 6 was the "Bruel and Kjaer Type 2215 Precision Sound Level Meter and Octave Analyzer." While the average cabin noise level reductions on the Twin Otter are a large 10 dBA, the noise reductions in the cockpit are an even greater 13 dBA in cruise.

These large sound level reduction6 have been enhanced due to the 9-inch reduction in propeller diameter as well as a reduction in propeller cruise rpm from 76% (1672 rpm) to 71% (1562 rpm).

Included for comparison In Figure 6 are the interior sound levels of the Hawker Sidley HS748 and the Cessna Citation II. Predominant noise on the former comes from the propeller tips, and on the latter from engine noise.

The Quiet Turbofan-equipped Twin Otter in typical cruise is quieter than all other examples shown in Figure 6.

The significance of a 13 dBA reduction In sound levels is even more striking when considering the relationship between dBA and actual Bound pressure energy. A 13 dBA reduction

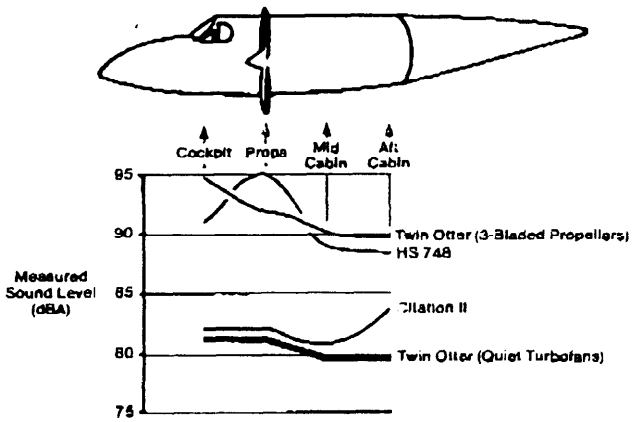

Figure 6. Interior cruise sound levels -various aircraft.

removes more than 75% of all the acoustic pressure In the air and 95% of tne acoustic energy.

MEASURED EXTERNAL SOUND LEVELS FROM FLYOVERS

The external noise generated by the DHC-6-300 Twin Otter and Beechcraft Super King Air 200/B200 is typical of turboprop aircraft, and contains a strong component from the propellers.

The propeller blade tips, operating at high subsonic speed, generate a noise signal consisting of a tone at the blade passage frequency, with harmonics at levels which reduce with frequency.

The signal strength is dependent on the propeller tip Mach number and tip loading. Relatively small changes in these parameters can cause significant changes in the sound levels.

Because the Raisbeck Quiet Turbofans typically Offer both the reduction in propeller diameter as well as reduced tip loading, flyover noise reductions conducted per applicable provisions of Federal Aviation Regulation, FAR part 36, can be quite dramatic,

FAR Pan 36 requires all aircraft to be at or below specified noise level limits. For propeller-driven aircraft of less than 12.500 pounds gross weight, these noise levels are evaluated with the subject aircraft in level flight at a height of 1,000 feet over the microphone with the aircraft operating at maximum power and maximum normal propeller rpm. A minimum of 6 flyovers are required in order to determine the maximum A-weighted sound levels for the particular aircraft/ propeller combination.

BEN Laboratories analyzed and certificated the flyover noise levels per FAR Part 36 for both the Super King Air and the Twin Otter equipped with the Quiet Turbofans. BEN Laboratories made the physical measurements for the Twin Otter flyovers, while the FAA conducted the tests for the Super King Air.

The Turbofan-equipped DHC-6-300 Twin Otter certified at 72.3 dBA, a 5.1 dBA reduction from the originally-equipped Twin Otter with the three-bladed propeller.

The Turbofan-equipped Beechcraft Super King Air 200/ B200 FAR Part 36 noise levels were reduced 4.2 dBA, to 75.0 dBA.

In both cases, "before" and 'after" propeller rpm, aircraft speed and engine horsepower were identical.

During the course of the program on the Twin Otter, additional data were acquired at operating conditions other than those specified by FAR Part 36. The aircraft was also flown at propeller rpm settings above and below that required for certification.

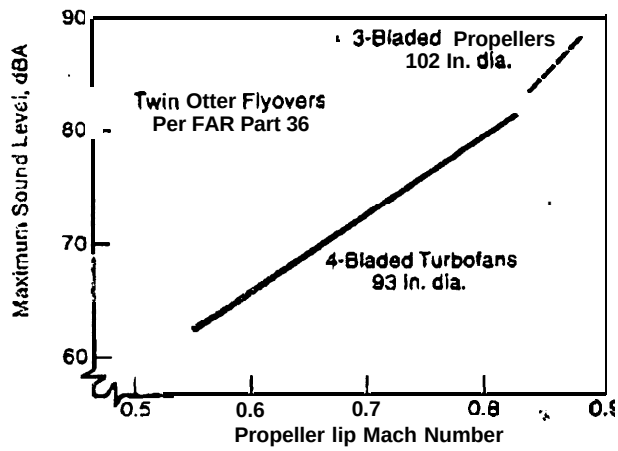

Figure 7. Effect of tip Mach no. on sound levels.

Figure 7 shows the results of these additional flyovers, with noise level shown versus propeller tip Mach number. The line shown was obtained by a Linear Regression Analysis. Note the steeper slope of the three-bladed propeller, indicating greater noise prooagation at increasing tip Mach number.

The influence of these relationships on actual noise versus propeller rpm is shown on Figure 8. Noise level comparisons are made for the original versus the new Turbofan-equipped Twin Otter under the same operating conditions-

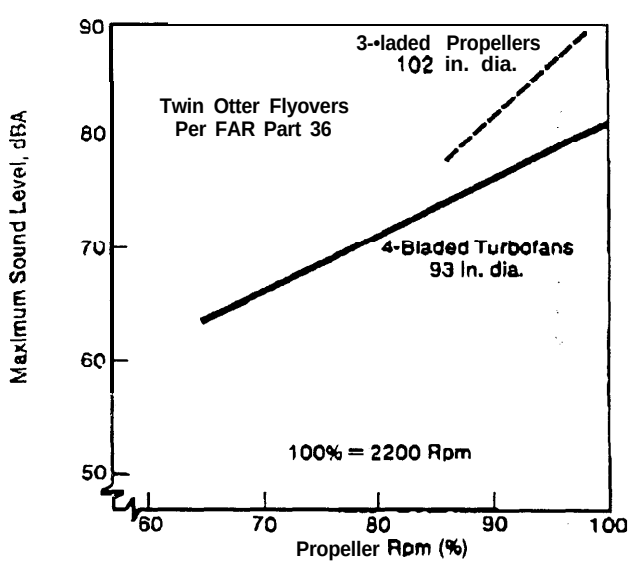

figure 8. Effect of rpm on sound levels

At a Setting of 100% rpm (2200 rpm) the noise generated by the Turbofan-equipped Twin Otter is approximately 10 dBA lower than the original three-bladed propeller.

At the measurement conditions specified by FAR Part 36, 91%, the reduction is approximately 5 dBA.

Under normal cruise power and rpm settings, the noise level received at the ground surface has been reduced even further. Rpm's of 85% (1412 rpm) were measured. At typical cruise power and at this rpm, the noise generated during 1000 foot flyovers was less than 65 dBA.

Applications of this turbofan/airframe combination have achieved a high level of success at Scenic Airlines, who routinely fly Over the Grand Canyon with their fleet of 15 turbofan-equipped Twin Otters.

PERFORMANCE CONSIDERATIONS

Noise reductions in propulsion are more easily achieved when the resulting performance is not important. However, performance remains an extremely Important part of overall airplane utility.

The noise reductions reported in this paper were achieved with no loss in FAA-Certified or normal cruise performance.

On the Turbofan-equipped Twin Otter, the increased ram air recovery boosted the engine output horsepower by 5% and increased its flat ratings by 9° Fahrenheit or 1400 feet in altitude.

The Turbofan-equipped Super King Air 200 has had its flat rating increased by more than 2000 feet, with a 480 feet per minute increase in twin-engine rate of climb, 2000 feet higher Initial cruise altitude, and associated reduction in block fuel consumption of approximately 9%.

Stopping distance with maximum reverse thrust, in both aircraft, has been reduced approximately 50%.

SUMMARY

The application of state-of-the-art technologies in aerodynamics and materials ha6 joined newly available CAD/CAM techniques in engine/propeller/airframe Integration to bring about a new class of propellers for general aviation turboprop twins.

These new propellers. coined "Quiet Turbofans," are measurably reducing cockpit and cabin noise and vibration, while at the same time lowering the FAR Part 36 flyover sound levels.

Sound level reductions of up to 13 dBA have been measured, while allowing the aircraft to retain or Increase their overall performance levels.

REFERENCES:

1. H V. Borst, 'Propeller Performance and Design As Influenced By the Installation," SAE Technical Paper 810602.

Exhibit “E”

See Attached

September 27, 1996

Federal Aviation Administration
Office of the Chief Counsel
Attention: Rules Docket (AGC-200)
Docket No. 28537
800 Independence Ave., S.W.
Washington, D.C. 20591

Re: Proposed Special Flight Rules in the Vicinity
of Grand Canyon National Park, Docket No. 28537

Gentlepersons:

Grand Canyon Airlines ("GCA") appreciates the opportunity to comment on the proposed changes to the Special Flight Rules Area at Grand Canyon National Park.

GCA is based at the Grand Canyon National Park Airport, Grand Canyon, Az., where it has conducted aerial sightseeing and provided fixed base services since 1927. The vast majority of GCA's business activity is in providing local air tours over Grand Canyon to visitors of GCNP who arrive by car or bus. Many of GCA's passengers do not have either the time, physical or financial ability, or even the desire, to experience Grand Canyon as hikers, campers, river rafters, mule riders, etc. What GCA's passengers do share in common is the joy of personal discovery and adventure as they try to comprehend the powerful forces of nature at work at Grand Canyon which truly can be experienced and appreciated only by air.

GCA is one of two Grand Canyon air tour companies which operate specially modified deHavilland DHC-6 Twin Otters known as "Vistaliners." The

Vistaliner was developed in 1983 by GCA and its affiliate through common ownership, Twin Otter International, to be the finest air tour aircraft possible.

The Vistaliner features picture windows for panoramic canyon views from each of its 19 passenger seats. The Vistaliner meets all the standards for operations under Part 12 1 air carrier regulations including having mid-air collision avoidance and ground proximity warning systems. GCA's Vistaliners are flown only by Captains and First Officers who meet, and are trained to, GCA's exacting airline standards.

Importantly, the Vistaliner is one of only three air tour aircraft models recognized by National Park Service ("NPS") as "quiet." The technology which makes this possible is a specially certified four blade prop system which makes the Vistaliner sixty-six percent quieter than a factory-standard Twin Otter even though a factory-standard Twin Otter is already considered very quiet.

GCA conducts air tours with Vistaliner aircraft only and we currently operate four Vistaliners in air tour service. The company expects to carry approximately 62,000 passengers in 1996 and it expects to account for about 80 percent of all fixed-wing air tour passengers embarking from the Grand Canyon National Park Airport. For reasons which will be explained later, GCA's flight tour activity is substantailly down in 1996 from a peak of 95,000 passengers in 1993.

G-CA has long been an advocate for incentives for air tour operators at Grand Canyon and at other national parks to invest in quiet aircraft technologies. For the past ten years and since GCA first employed quiet props on its Vistaliners, GCA has recognized that it needed to be a good neighbor to ground visitors at Grand Canyon by substantially reducing the audibility of its air tour aircraft. GCA actively sought enactment of the 1987 National Parks Overflights Act and the subsequent implementation of SFAR 50-2. When National Park Service lacked funds to study the benefits of quiet aircraft technologies at Grand Canyon, GCA joined with several other companies concerned about, and committed to, quiet aircraft development to make a $50,000 no-strings donation to NPS so that it could finish research on the benefits of quiet aircraft at Grand Canyon in time for the NPS overflight report to Congress.

It is because of our sizable investment in, and our steadfast commitment to, reducing aircraft audibility at Grand Canyon that we were so disappointed with this FAA rulemaking. Quiet aircraft technology offers the best alternative, and the best strategy, for improving the natural quiet at Grand Canyon. GCA's own operating history best illustrates the benefits of quiet aircraft deployment.

Prior to introducing the Vistaliner, GCA operated a fleet of conventional Cessna 207s in air tour service. The 207 seats just six passengers whereas the Vistaliner seats nineteen. Although the 207 is a single-engine aircraft, its noise level is many times greater than GCA's Vistaliners equipped with quiet props. Thus, not only is each and every air tour flight conducted by GCA today with its Vistaliners substantially less audible than when it operated 207s, but now it takes two-thirds less flights to carry the same number of passengers as before.

The benefits of quiet aircraft technology for reducing air tour aircraft audibility at Grand Canyon were acknowledged by NPS in its aircraft overflight report to Congress. Yet, NPS recommendations were ignored by FAA in this rulemaking. In its place, FAA has proposed unacceptable and unproductive operations "caps" and "curfews" and the doubling of the amount of restricted "flight free" airspace at Grand Canyon.

Arbitrary restrictions on quiet air tour operations in preference to providing incentives for air tour operators to invest in quiet aircraft technologies seems to be at best questionable public policy---particularly, when that policy is based on a definition of "natural quiet" that is an artificial noise metric rather than an improvement in the quality of ground visitor experience.

Quiet aircraft technology is available now for both fixed-wing and rotorcraft and it could be adapted quickly to other existing air tour aircraft models. Several manufacturers currently produce, or plan to produce, aircraft which will meet NPS "quiet" aircraft standards. (Besides the Vistaliners operated at Grand Canyon, Scenic's nine-seat Cessna Caravans are also considered "quiet.") The benefits of encouraging use of such larger, and quieter, aircraft such as the Vistaliner should be obvious. Not only is each flight less audible, therefore less noticeable to park visitors, but there can be major reductions in the number of air tour operations in the future.

Unfortunately quiet aircraft technology is not free and quiet aircraft like the Vistaliner and the Caravan are more expensive than conventional aircraft. A new Caravan costs approximately $1.25 million while GCA spends about $1.4 million to purchase Twin Otters in Vistaliner configuration. Alternatively, GCA could purchase twelve Cessna C-207s or seven Cessna C-402s/Piper Navajos for the price of either one Caravan or one Vistaliner.

To remain competitive, despite operating more expensive quiet aircraft, Grand Canyon Airlines has had to rely on greater flight utilization. Unless other air tour operators can expect greater utilization to amortize their purchases of quiet aircraft technologies, what incentive will they have to make similar investments? This is why the proposed restrictions on the number of flights (caps) or hours of the day air tour flights may be conducted (curfews) are so counter-productive to increased use of quiet aircraft technologies.

In its report to Congress NPS strongly emphasized the need for quiet aircraft incentives such as preferred routes and altitudes. The NPS also recognized that it would take tune for air tour operators of conventional aircraft to develop quiet aircraft technologies as well as time for such operators to convert their fleets. The NPS accordingly proposed that some flight tour routes be restricted now to "quiet aircraft only" while other Grand Canyon air tour routes be added over a fifteen year time frame, after which only quiet aircraft would be permitted to conduct air tours over the Park. GCA agrees with these NPS recommendations and it would add just two more: the existing $25 Grand Canyon overflight fee must be abolished for operations of quiet aircraft and quiet aircraft must not be subject to curfews or caps.

GCA believes that SFAR 50-2 provides now for a good and proper balance between enabling it to offer a quality aerial sightseeing experience with minimal audibility for ground visitors. NPS Park visitor surveys confirm this overwhelmingly. Further, we believe that SFAR 50-2 achieves the intent of Congress in enacting the 1987 National Parks Overflights Act. That is not to say that we do not believe that more can be done. This rulemaking is the wrong way because it is a radical overhaul of SFAR 50-2 rather than a reasoned approach that provides incentives for air tour companies to operate larger and quieter aircraft. The result is that this rulemaking affects GCA in several very consequential ways:

First, FAA proposes to make the Zuni flight corridor one-way where it permits two-way air tours now. This change would eliminate GCA's important east Canyon air tour which is flown when low ceilings otherwise preclude operating GCA's primary "Grand Discovery" air tour which flies up the Zuni, over the north rim and back down through the Dragon flight corridor.

Second, FAA proposes to extend the northern boundary of the Bright Angel flight-free zone to the Grand Canyon National Park boundary. This will lengthen the distance of the Grand Discovery air tour by 20 percent and therefore increase GCA's air tour operating costs by a corresponding 20 percent. GCA's fifty minute Grand Discovery tour is currently priced about the same as the very popular 25 minute helicopter tours which operate exclusively within the Dragon. Since, for the same price, most people prefer the novelty of a combined helicopter ride with a Grand Canyon air tour, still higher Vistaliner tour costs and resulting higher ticket prices will only further promote even greater air tour passenger demand for smaller, less quiet aircraft than the Vistaliner.

The proposed new, longer north rim air tour route creates other significant problems for GCA. The Grand Discovery tour would be required to operate over the highest points of the north rim of Grand Canyon where low ceilings can be a factor. That will result in more frequent flight cancellations for GCA. Since FAA proposes to limit the Zuni Corridor to one-way air tour flights only, GCA would no longer be able to offer the east Canyon tour as a viable alternative on weather days.

The added distance over the north rim requires more fuel (an additional 110 pounds) which in turn reduces payload and which in turn further restricts passenger capacity. This is a problem particularly when high ambient summer temperatures require artificial limits on passenger loads in order for GCA's Vistaliners to maintain enroute altitude in the unlikely event of engine failure. (An FAA Part 121 rule which does not apply to nine seat or less single/multi-engine aircraft with which the Vista-liner must compete.) Finally, it appears that the new north rim air tour route will pass directly over the Saddle Mountain Wilderness Area rather than remaining within Grand Canyon National Park boundaries. This is a questionable aircraft audibility trade-off for ground visitors at Saddle Mountain.

These new air tour flight restrictions would be imposed by FAA even though the north rim of Grand Canyon National Park is closed to ground visitation eight months of the year and despite that the dense forest vegetation found there largely attenuates GCA's Vistaliner audibility during the four months of the year the north rim area of the Park is open.

The extremely adverse economic effects of these proposed FAA actions on GCA cannot be overstated. FAA's economic analysis is poorly conceived and demonstrates little understanding of business decision-making. Profits, rather than revenues, normally drive business investments. Profits earned are not proportional to changes in revenue as FAA's analysis must assume---rather they are best described by the 80-20 rule. A twenty percent reduction in revenue results in an eighty percent reduction in profits---if any profits remain at all.

GCA, like all airlines, is highly capital intensive. G-CA's investments in aircraft and facilities are the same whether GCA flies 80 percent, or 100 percent, of its air tour potential. Likewise, profits at GCA, like those of all airlines, are highly leveraged by load factor. Vistaliner operating costs are the same whether there are sixteen or nineteen passengers onboard. Effectively, the revenue (ticket price) derived from each passenger on a flight over break-even goes straight to the bottom line as profit.

These principles are taught to first year economics students but FAA has failed to apply them. However, we must apply these real-world principles to Grand Canyon Airlines. If the FAA rulemaking is adopted as proposed, it will result in significant losses for GCA. What FAA fails to recognize is that no one proposed FAA action cuts deeply for Grand Canyon Airlines. In the aggregate---no alternate east Canyon tour, increased over-the-north-rim tour operating expenses, more frequent weather cancellations, fewer passengers per flight due to more fuel required and/or reduced payload to meet single engine performance rules, and proposed caps and curfews that limit numbers of flight operations---these restrictions effectively result in that 80-20 rule becoming a disastrous reality for GCA.

The solution for Grand Canyon Airlines to the problems created by this FAA rulemaking lies in part with the NPS recommendations to Congress. GCA

recommends that the existing north rim fixed-wing air tour route be preserved, but limited to, quiet aircraft only. Second, GCA recommends that the Dragon flight corridor be converted, within two years, to a quiet airplane flight corridor. Finally, GCA recommends that FAA define what operating characteristics any airplane model must have in order for it to conduct round-trip air tours within the Dragon corridor---then immediately permit such fixed-wing air tours within the Dragon---as FAA now already permits out-and-back helicopter tours.

We believe GCA's Vistaliners will qualify because they have the requisite flight handling characteristics. The deHavilland Twin Otter from which the Vistaliner is derived meets the standards for short take-off and landing (STOL performance) including being designed with high-lift wing devices. High-lift wing devices permit normal, and safe, flight operations at low speeds including cruise.

GCA uses the STOL capabilities of its Vistaliners now to conduct its Grand Canyon air tours at 90 kts, a cruise airspeed even lower than those by which helicopter tours are flown through the Dragon. Because of this STOL performance capability, the Vistaliner can easily and safely make the required 180 degree turn at the North end of the Dragon within the two mile width of the flight corridor at a bank angle of less than 10 degrees (one half that bank angle for a standard rate turn). The engine power required for cruise at 90 kts by the Vistaliner is only 50 percent, further reducing its audibility and therefore improving its acceptability, for flights within the Dragon corridor.

Since SFAR 50-2 management policies now encourage rotorcraft operators to concentrate on Dragon tours almost exclusively, it is important that Grand Canyon Airlines also be permitted to conduct similar round-trip Dragon tours. This is necessary if GCA is to remain competitive particularly if FAA adopts the extended north rim air tour route. Already, there has been a significant erosion in GCA's Vistaliner passengers to helicopters, an erosion that began the same time helicopter operators began concentrating their air tours within the Dragon. As a result, GCA expects to conduct 35 percent less air tour flights in 1996 than in 1994, the year Dragon corridor helicopter tours first became popular. This erosion in market share is all the more significant for aircraft audibility at Grand Canyon. One Vistaliner air tour carries up to

nineteen passengers while it takes four rotorcraft operations to accomplish the same task.

With respect to the proposed curfews and operations caps, they must not be imposed on air tour aircraft meeting quiet aircraft standards. The most important incentive for operators to invest in quiet aircraft technologies is to have such investments pay-off by increased utilization. How much benefit is gained by imposing artificial curfews when one naturally exists---darkness? Setting operations caps, as we have learned from the operations of the High Density Rule slot committees and the maze of federal regulation of airport capacity for several years following the air controllers' strike, raises serious and difficult administrative problems. These should be considered only as a last resort. In any event, should FAA adopt operations limits based on the year ending July 31, 1996, FAA must recognize that base year will permanently lock Grand Canyon Airlines into operating forty percent less flights than it did just two years ago. Yet GCA operates the largest and quietest fixed-wing air tour aircraft in local Grand Canyon sightseeing. What are GCA's alternatives for the future under FAA's proposal? How do Grand Canyon ground visitors benefit by limiting the number of GCA air tour flights to forty percent less than two years ago if the objective is less overall flights in larger aircraft that are less audibile?

For these reasons, Grand Canyon Airlines urges FAA to withdraw this rulemaking. In its place we believe FAA must adopt strong incentives for quiet aircraft technologies as the primary means of restoring natural quiet at Grand Canyon through reducing aircraft audibility. The rulemaking is flawed due to technical, administrative and legal shortcomings which are identified in the joint industry comments to which Grand Canyon Airlines is signatory. If FAA's fails to correct these deficiencies in a rush to issue a final rule, it will only invite vigorous and protracted litigation.

We have described how the proposed rule would severely impact Grand Canyon Airlines with little benefit to NPS objectives. Incentives for quiet aircraft deployment will encourage other Grand Canyon air tour operators to convert their fleets of conventional, to quiet, aircraft. Those incentives must include preferred routes and altitudes, elimination of overflight fees and no curfews or caps. With little administrative change, and with no deterioration

in air safety, GCA's quiet and STOL performance Vista-liners must be permitted to conduct air tours within the Dragon. As the NPS has recommended, the Dragon should eventually be limited to operations of quiet aircraft only. The alternative---what FAA has proposed---will drastically curtail GCA's ability to operate profitably and to continue operating larger and quieter---and more expensive---Vistaliner aircraft.

Its is GCA's desire instead to continue offering the highest quality sightseeing air tours at Grand Canyon and which it has done continuously since 1927. We can conceive of no greater threat to this objective than this rulemaking. Thank you for your interest in the views of Grand Canyon Airlines.

Sincerely,

John R. Seibold
President